



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/732,927	12/11/2000	Nobuo Shimazu	740107-135	2306

22204 7590 02/10/2003

NIXON PEABODY, LLP  
8180 GREENSBORO DRIVE  
SUITE 800  
MCLEAN, VA 22102

EXAMINER

FERNANDEZ, KALIMAH

ART UNIT PAPER NUMBER

2881

DATE MAILED: 02/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/732,927

Applicant(s)

SHIMAZU ET AL.

Examiner

Kalimah Fernandez

Art Unit

2881

**Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 02 December 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Drawings***

1. The corrected or substitute drawings were received on 12/2/02. These drawings are approved.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 8 stand rejected under 35 U.S.C. 102(b) as being anticipated by US Pat No 3,874,916 issued to Livesay et al.
3. Livesay et al discloses the fabrication of a master mask having a pattern (24) (col.5, lines 8-19).
4. Livesay et al discloses the use of said master mask to create a mask blank/ final mask (col.4, lines 63-65). Livesay et al discloses fabrication of child mask(s) by electron exposure of said mask blank (col.6, lines 22-28).
5. Claims 1 and 8 stand rejected under 35 U.S.C. 102(b) as being anticipated by US Pat No 4,827,138 issued to Randall.
6. Randall discloses manufacturing a master mask and using said master mask to manufacturing child mask(s) (col.5, lines 39-50).

Art Unit: 2881

7. Randall discloses proximity printing and a 1:1 correspondence between the mask pattern and printed pattern (col.3, lines 47-53).

8. In addition, Randall discloses the use of electron beam lithography (col.3, lines 59-68).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 3 and 10 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Randall.

11. Randall teaches the claimed invention except for using the child mask as the master mask in the electron beam proximity exposure method.

12. Rather, Randall teaches the use of the first mask fabricated as the master mask (col.5, lines 43-45).

13. However, it would have been obvious to an ordinary artisan to use the second mask fabricated as the master mask or using each previous mask to fabricated the next mask since the breadth of Randall's disclosure suggest that any mask fabricated according the disclosed method can act as a master mask.

14. Claims 2,4,9 and 11 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Randall and in view of US Pat No 4,463,265 issued to Owen et al.

Art Unit: 2881

15. Randall teaches the claimed invention except for "the master mask is exposed from a side facing the child mask and the child mask from the side facing the object". In addition, Randall does not teaches manufacturing the "child mask is n-times, a pattern exposed on the master mask is pattern right and left reversed from a pattern on the object when n+1 is an odd number and the pattern exposed on the master mask is a pattern non-reversed from the pattern on the object when n+1 is an even number".

16. However, Owen et al teaches the technique for compensates for the reduction in resolution due to the proximity effect, in which a reverse field pattern is defined as the negative of the circuit pattern to be drawn (col.4, lines 1-16).

17. Owen et al teaches exposing a workpiece (or a child mask) to a desired pattern and subsequently exposing said workpiece (or child mask) to a reverse exposure (col.6, line 49- col.7, line 3; col.8, lines 57-67).

18. It would have been obvious to an ordinary artisan to combine the teachings of Randall and Owens et al since Owens et al discloses the advantage of compensation for the proximity effect caused by electron exposure (see col.9, lines 5-30). That is, an ordinary artisan would have found obvious motivation to expose the reverse pattern of master mask onto the child mask to compensate for the proximity effect as taught by Owens et al.

19. Claims 5-7 and 12-14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Randall and in view of US Pat No. 6,177,680 issued to Dick et al.

20. Randall teaches the claimed invention except for correcting distortion.

21. However, Dick et al teaches generation of corrected pattern data, which measures distortion and compensates for said distortion by changing the beam control data including the beam deflection (i.e. the application of the beam direction) (col.5, lines 15-45).

22. It would have been obvious to an ordinary skilled artisan to combine the teachings of Randall and Dick et al since Dick et al teaches fabrication of mask free of pattern-dependent errors with the advantage of a reduction in processing time (col.2, lines 1-5).

23. As per claims 6-7 and 13-14, the obvious combination of Randall and Dick et al reads on extending the correction to the distortion generated when using the master mask in fabricating the child mask.

#### ***Response to Arguments***

24. Applicant's arguments filed 12-2-02 have been fully considered but they are not persuasive. Applicant argues that Livesay et al teaches an electron beam pattern generator, not to electron beam lithography. However, lithography is the generation of a pattern of an object (in this case a mask).

25. In responds to applicant's argument that "not only does Randall fail to teach how his concept might be applied to electron beam lithography, but his patent contains statements that those skilled in the art would find to clearly teach away from doing so because of the disclosed problems associated therewith".

26. Contrarily, Randall clearly teaches, "those skilled in the art will recognize that the present invention is not limited to use in connection with ion beam lithography or the

Art Unit: 2881

printing of patterns on integrated circuits". And Randall's statements of the problems associated with electron beam lithography (col.1, lines 29-39) are specifically related to use in a serial mode.

27. In response to the argument that Randall's disclosure of the problems of electron lithography amounts to teaching away from the use electron beam lithography. Randall discloses the problems associated with ion beam lithography (col.1, lines 52-54).

28. Therefore, Randall's disclosure of the background clearly intends to describe the problems in the art using ion beam lithography, electron beam lithography, x-ray lithography and other similar techniques and introduce his improved mask. Whereas, Randall's improved mask is purposed to correct or alleviate the problems associated with ion beam lithography (col.2, lines 19-35).

29. Randall discloses that the use of his improved mask is not limited to ion beam lithography, but can be easily use in electron beam lithography.

30. Moreover, ion beam lithography and electron beam lithography are closely related art that it is held that an ordinary artisan would know from general skill how to use Randall's improved mask in electron beam lithography.

### ***Conclusion***

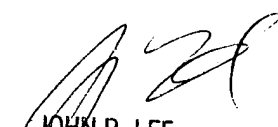
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kalimah Fernandez whose telephone number is 703-305-6310. The examiner can normally be reached on Mon-Thus between 8:30am-6:30pm.

Art Unit: 2881

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Lee can be reached on 703-308-4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

kf  
February 4, 2003

  
JOHN R. LEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800